BRUHAT BANGALORE MAHANAGARA PALIKE

Name of work: Establishment of RO plant in Ward No.07 Byatarayanapura

			Estimate Cost Rs.					1300000.00	
Sl No	Description of item	Unit	No	L	B	D	Qty	Rate	Amount
1	KSRB 2-1.1: Earth work in surface excavation in ordinary soil for leveling and lowering the ground manually (other than foundation of buildings, culverts, road drains and trenches of pipe line and cables) and removing the excavated stuff to a distance not exceeding 50m and lift upto 1.5m, excavated surface leveled and neatly dressed, disposed earth to be leveled after breaking of clods and neatly dressed as per specifications, Specification No KBS 2.1(a) / 2.3.1,P. No. 5/ Item No. 2.1/ PWD SR 2016-17								
	Basic Rate	157	cum						
	Area Wieghtage 8%	12.56							
	Total Rate	169.56							
			1	4.50	3.50	0.23	3.62	169.56	2970.00
			1	14.70	0.90	1.05	13.89		
							17.51		
2	KSRB-4-1.3 : Providing and laying in position plain cement concrete of mix M 1:4:8 withOPC cement at 180kgs, with 40mm and down size graded granite metal coarse aggregates @0.892cum and fine aggregates @0.57cum machine mixed, concrete laid in layers not, exceeding 15cms, thick, well compacted, in foundation and plinth, including cost of all materials, labour, HOM of machinery, curing complete as per specifications. Specification No. KBS 4.1,4.2, No. 12/ Item No. 4.3/ PWD SR 2016-17								
	Basic Rate	4867.0							
	Area Wieghtage 8%	389.36							
	Total Rate	5256.4							
			1	14.70	0.90	0.15	1.98		
			1	4.25	3.10	0.15	1.98		
							3.96	5256.36	**20819.00**
3	KSRB 5.2.3 : Providing and constructing granite / trap / basalt size stone masonry in **foundation with cement mortar 1:6**, stone hammerd dressed in courses not less than 20 cms high, bond stones at two m. apart in each course including cost of materials, labour, curing complete as per specifications.KBS 5.1.13 **Page No. 23 / Item No. 5.6 / PWD SR 2016-17**								
	Basic Rate	4187.00							
	Area Wieghtage 8%	334.96							
	Total Rate	4521.96							
			1	14.70	0.75	0.5	4.96		
			1	14.70	0.60	0.4	3.09		
							8.05	4521.96	**36394.00**
4	KSRB 5.3-3 : Providing and constructing granite / trap / basalt size stone masonry in **basement with cement mortar 1:6**, edges of stones chistle dressed in courses not less than 15 cms high, bond stones at two m. apart in each course including cost of materials, labour, curing complete as per specifications.KBS 5-1.13 **Page No. 23 / Item No. 5.9 / PWD SR 2016-17**								
	Basic Rate	5005.00							
	Area Wieghtage 8%	400.4							
	Total Rate	5405.40							
			1	14.70	0.45	0.3	1.98	4814.52	**9554.00**
5	KSRB 2.3 : Filling available excavated earth (excluding rock) in sides of foundations upto plinth in layers not exceeding 20 cms. in depth, compacting each deposited layer by ramming after watering with lead upto 50 m. and lift upto 1.5 m. including cost of all labour complete as per specifications. Specification No. KBS 2.9 **Page No. 6 / Item No. 2.10 PWD SR 2016-17**								
	Basic Rate	127.00							
	Area Wieghtage 8%	10.16							
	Total Rate	137.16							
			1	4.25	3.10	0.5	5.93	137.16	**813.00**

Sl No	Description of item	Unit	No	L	B	D	Qty	Rate	Amount
6	KSRB 4-1.6 : Providing and laying in position plain cement concrete of **mix 1:2:4 with cement @ 240 kgs with 20mm** and down size graded granite metal coarse aggregates @ 0.878 cum and fine aggregates @ 0.459 cum, machine mixed, concrete laid in layers not exceeding 15cms, thick, well compacted, in foundation, plinth and cills, including cost of all materials, labour, HOM of machinery, curing complete as per specifications, specification. No. KBS 4.1,4.2. **No. 12/ Item No. 4.6/PWD SR 2016-17**								
	Basic Rate	5441.00							
	Area Wieghtage 8%	435.28							
	Total Rate	5876.28							
			1	14.70	0.45	0.10	0.66		
			1	4.25	3.10	0.1	1.32		
							1.98	5876.28	**11629.00**
7	KSRB 5-14 : Providing and constructing precast concrete solid blocks with compressive strength not les than 35 Kg/sqm with cement mortar 1:4 masonry (quoin, Jamb, closer blocks) with solid concrete blocks of size 40x20x20 cms conforming to I.S: 2185/1965 in superstructure including cost of materials, labour charges, scaffolding, curing complete as per specifications. **Page No. 27/ Item No. 5.27/ PWD SR 2016-17**								
	Basic Rate	937.00							
	Area Wieghtage 8%	74.96							
	Total Rate	1011.96							
	Wall all round		1	14.70		3.1	44.84		
	Deductions rolling shutter		1	2.80		1.2	-3.36		
	window		1	3.45		1.8	-6.04		
							35.44	1011.96	**35861.00**
8	KSRB 15.3.6 : Providing 15mm thick cement plaster in single coat with cement mortar 1:6, to brick masonry including rounding off corners wherever reuired smooth rendering, : Providing and removing scaffolding, including cost of materials, labour. Curing complete as per specifications. **Page No. 113/ Item No. 15.14 / PWD SR 2016-17**								
	Basic Rate	167.00							
	Area Wieghtage 8%	13.36							
	Total Rate	180.36							
	Wall all round 2 sides		2	14.70		3.1	89.67		
	Deductions rolling shutter		2	2.80		1.2	-6.72		
	window		2	3.45		1.8	-12.08		
							70.88	180.36	**12783.00**
9	KSRB 7.8 : Providing and fixing in position in cement concrete 1:3:6 steel glazed windows and ventilators side hung/top hung 2/3 openable 1/3 fixed as per approved drawings using Z angles of 25x33x3mm, weighing 1.419Kg/m both for outer and inner frames and central mullion section of size 25x46x3mm weighing 2.28Kg/m all duly providing T section 19x19x3mm weighing 0.839 kg/m for glazing of windows not more than 34 cms. c to c including providing and fixing 4mm thick reeded glass with teakwood beading of required size, all steel section should confirm to I.S. 7452:1990, 4nos, of holdfasts of approved size section should be cut to length welded and electrically grinded subdividing frames of unit shall be tenonned and revetted into the frames electrically. All the steel surface shall be thoroughly cleaned free of rust and painted with one coat of anti-corosive paint and finishing two coats of ready mix paint of approved colour and make including cost of materials, fixtures, labour and HOM of machinery complete as per specifications. **Page No. 31/ Item No. 7.8/PWD SR 16-17**								
	Basic Rate	2975.00	cum						
	Area Wieghtage 8%	238.00							
	Total Rate	3213.00							
			1	3.45		1.8	6.04	3213.00	**19398.00**

Sl No	Description of item	Unit	No	L	B	D	Qty	Rate	Amount
10	Fabricating, supplying & erecting M.S. Angular Truss of span upto 10m The bottom & top member is providied with 50x50x6mm double equal angles, welded back to back and in between top and bottom line, in areas of mid section is provided with 50x50x6mm queal single angle for vertical and inclined members and at supporting ends 40x40x5mm single angle is provided. all the members are welded together with 6mm gusset plate as per drawing no. CBS/SD/K-Mantap/9MND/97. The entiretruss is anchored in RCC coloumn by using 4 No.. of M.S.Anchor bolts at each support, with 10mm thick base plate and shoe plate. the work includes cutting straightening, placing in position of M.S. anble and welding whereverr necessary, and applying one coat of red oxide primer coat to all the members including cost of all materials, labour charegs, & hire charges of machineries for cutting, welding, grinding & erection equipments, etec., complete as per specification (PWD SR 16-17&& Page No. 41 & Item No. 7.30)								
	Basic Rate	117.00	Kgs						
	Area Wieghtage 8%	9.36							
	Total Rate	126.36							
			1	4.25	3.10		**13.18**		
				13.18	x10=		**131.75**		
							131.75	126.36	**16648.00**
11	Providing and fixing self-supported, ribbed, high quality, high grade (D:350 MPA Yst Min), pre- painted Galvalume steel roof sheet, coated with bare Galvalume coating AZ 150, @ 150 gms/Smtr 55%AL,45%Zn) by hot dip process , of total coated thickness as specified for different spans with a tolerance of +/- 0.02 mm, according to technical specification confirming to A 792, with NCCA 11-1, or ECCA T4 Pencil hardness HB, NCCA standard T-Bend test. The roof should be fastened to the gutter on the external sloping side, at an interval of 51mm Centre to Centre, to a depth of 65 mm with GI anchor bolts and neoprene washers &subjecting the gutter beam to Schmidt, Hammer test to ensure theanchorage of the anchor bolts. The self-supported roofing system shouldbe designed to with stand the wind load (As per IS 875 part-3) &Earthquake load (as per IS 1893) & the design should also comply withany other technical requirements such as turbo ventilators of 0.60 mts.dia and skylights of size 4.26 x 0.60 mts. fixed one in each row @ 10.00Mtr C/C along the length & hangers for electrical fixtures as per therequirements including cost of all materials &labour for erection, all leadand lift, loading and unloading, HOM of machineries etc., complete as perthe standard detailed technical specification, design and directions of theengineer in charge of the work..(a) Span : 9 Meters upto 15 Meters (b)Material Specification: Colour Coated Galvalume Sheet, weighing 10.10kg/sqm BMT: 0.80 MM, APT : 0.85 MM, tolerance +/- 0.02mm (PWD SR16-17 & Page No 94 & Item No 13.78)								
			1	4.50	3.05		**13.73**	2059.05	**28260.00**
12	KSRB: 7.5 Providing and fixing pull and push type rolling shutters of approved make out of 18 guage, 75mm wide cold rolled steel laths of convex corrugation, with side guides and bottom rail, with interlocking arrangements for steel laths by means of alternate clips, suspension shaft with High tension coil type springs two numbers, mounted on specially designed pipe shaft, with bracket plates, guide channels, ball bearing arrangements, for inside & outside locking with push & operations complete Including pulling hooks, 4nos handles wit hall fittings and accessories, painted with a coat of red lead paint (without top cover) cost of materials, labour, HOM of machinery complete as per specifications. Shutter size 3mx2.8m Specification NO. KBS 7.10 / 7.12 **Page No. 31/ Item No. 7.5/ PWD SR 2016-17**								
	Basic Rate	2862.00							
	Area Wieghtage 8%	228.96							
	Total Rate	3090.96							
	Rolling Shutter	Sqm	1	2.80		3.5	**9.80**	3090.96	**30291.00**
13	KARB 7.6 Providing and fixing top covers made out of 20 guage M.S. sheet over m pull and push rolling shutters bent to shape including cost of red lead primer coat of painting, materials, labour, HOM of machinery complete as per specifications. Shutter size 3mx2.8m Specification NO. KBS 7.10 / 7.12 **Page No. 32/ Item No. 7.6/ PWD SR SR 2016-17**								
	Basic Rate	473.00	rmt						
	Area Wieghtage 8%	37.84							
	Total Rate	510.84							
			1	3.00			**3.00**	510.84	**1533.00**

Sl No	Description of item	Unit	No	L	B	D	Qty	Rate	Amount
14	Providing flooring with 60cms. x 60 cms. size Vitrified glazed tiles of approved quality & make, fixed on top of existing flooring fixed with suitable adhesive, including cutting the tiles to the required size and fixing etc., complete. **Page No. 107/ Item No. 14.44 / PWD SR 2016-17**								
	Basic Rate	1069.00							
	Area Wieghtage 8%	85.52							
	Total Rate	1154.52							
	For flooring		1	4.25	3.10		**13.18**		
	wall all round		1	14.70		1.2	**17.64**		
	Deductions rolling shutter		1	2.80		1.2	**-3.36**		
							27.46	1154.52	**31697.00**
15	Providing and fixing chorinated poly Venyl cholride (CPVC) pipes conforing to IS 15778, having thermal stability for hot and cold water supplying including all CPVC plain and brass threaded fittings including fixing the pipe with clamp at 1.00 mtr spacing This included jointing of pipes and fittings with one step CPVC solvent cement and testing of joints complete (internal work exposed on wall(-20mm nominal OD pipes. (PWD SR16-17 & page No. 96 Item No. 13.85.2)								
	Basic Rate	135.00							
	Area Wieghtage 8%	10.80							
	Total Rate	145.80							
			1	195.00			**195.00**	145.80	**28431.00**
16	Providing and fixing gun metal wheel vave conforming to IS specification of approved make as per directions including all lead and lift etc., complete. **Page No. 94/ Item No. 13.79 / PWD SR 16-17**								
	Basic Rate	295.00	nos						
	Area Wieghtage 8%	23.60							
	Total Rate	318.60							
			1	6.00			**6.00**	318.60	**1912.00**
17	KSRB 13-11.1 : Providing and placing on terrace, polthylene water storage tanks with manhole lid and suitable locking arrangements, making holes of suitable diameter for inlet, outlet and over flow pipes, including cost of all materials, labour, transport charges, HOM of equipments and testing complete as per specifications. (For 1000 litre capacity) Specification No. KBS 13.22 (P.94/I.13.78 PWD SR - 2016-17).								
	Basic Rate	8467.00	nos						
	Area Wieghtage 8%	677.36							
	Total Rate	9144.36							
			1	4.00			**4.00**	9144.36	**36577.00**
18	1HP/7.5KW Atalanta/Suguna/CRI / Kirloskar /Other Equivalent pumps (PWD SR16-17 & Page No. XXXXII & S.NO. 1)								
		nos	1	1.00			**1.00**	12600.00	**12600.00**
19	**Providing R.O. Plant**								
	Providing revsrse osmosis suystem to cover 2000 Liters of High TDS water per hour								
	TECHNICAL SPECIFICATIONS								
	Flow Rate:								
	Feed Water : 5000 LPH								
	Treated Water : 3000 LPH								
	Reject Water : 2000 LPH								
A	**RAW WATER PUMP**								
	Purpose:- To feed the Dual Medial filter at pressure more than 2.00 bars which is min operating pressure for filter?								
B	**SAND MEDIA FILTER**								
	Purpose:- To remove the total suspendred solids, dirt, iron and reduce silt density index which can foul the members								
C	**ACTIVATE CARBON FILTER**								

Sl No	Description of item	Unit	No	L	B	D	Qty	Rate	Amount
	Purpose:- To remove the total color, smell, odor from the water.								
	Media: Mixed bed sand media consisting of the following i) Gravel ii) Pebbles iii) carbon Average porosity 50 micron particulate size bed depth : 1500 mm pipelines & Accessories : Pipe of PVC 10 Bar tested								
	DOSING SYSTEM								
	Purpose : To dose anti scaling chemical to protect the scaling formation on RO Membranes								
D	**MICRON FILTER**								
	Purpose : To remove the fine particles ip to 05 microns and reduce silt density levels to acceptable level.								
E	**HIGH PRESSURE PUMP**								
	Purpose : To feed the reverse Osmosis membrane at pressure more than the osmotic pressure taking into consideration flux rate, flow and recovery								
	RO membrane housing.								
	Purpose : To pack membrane and operate at high pressure.								
	RO MEMBRANES								
	Purpose : To remove the major part of TDS into 98% by Reverse Osmosis Membranes arranged and designed to give adequate flow the Recovery.								
	RO CLEANSING SYSTEM								
F	**ELECTRICAL PANEL**								
	Purpose : A control panel is provided as a safety measure for the pumps & other electrical items.								
	Specifications a) Complete starters, overload relays, b) Voltmeter, Ammeter, MCB's indicating lights, c) Rocker switches for Dozers, d) incomers, Auto-Manual switches.								
	INSTRUMENTATION								
	Purpose : a) Flow meter : To measure the online flow of water flowtec b) Low pressure switch : To protect RO pump from dry running c) High pressure switch : To protect RO pump from back pressure d) Pressure Gauges : For calculate AP for each unit in RO system								
	PH DOSING SYSTEM								
	Purpose to dose sodium Bi-carbonate for enhances product water SS till the pre-filteration & SS from HPP to thhe premeter line termination point NRV's pressure relief valves, wherever needed the system will be on common SS base frame supply & manufacture of complete Reverse Osmosis plant stainless steel tank (2kl) Raw water tank (5kl) with stainless steel pipe line required for plant erection.								
			1				1	810000.00	**810000.00**
	ELECTRIFCATION								
20	Supplying and wiring adopting loop system in existing PVC Conduit / casing capping using 1100V grade, COPPER conductor flexible multistrand FRLS PVC insulated, 2 X1.5Sq.mm Cable confirming to the GTP, with a 6Amps flush type SP control switch shall be fixed on the existing plastic sheet / gang box, the other end of the wires shall be terminated with sufficient loose length in a wood/PVC round block. complete for each outlet. GROUP A b) Medium point above 3Mtr upto 6Mtr from tapping point to out let via switch **(Page No. 05, Item No.2.1 KPWD SR 2014-15**								
		Point	6				6	245.00	**1470.00**
	c) Long point above 6Mtr upto 10Mtr from tapping point to out let via switch	Point	6				6	363.00	**2178.00**
21	Supplying and flush mounting teak wooden box without front plank, made of not less than 12mm thick wood, after due groove cutting, Finishing with necessary cement plastering complete (1.6.5) 4"x4"x3" (101x101x76mm) **(Page No. 03, Item No. 1.6) KPWD SR 2014-15**								
		Each	30				30	68.00	**2040.00**
	(1.6.1) 12"x12"x3" (300x300x76mm)	Each	18				18	116.00	**2088.00**
	(1.6.3)10"x7"x3" (254x178x76mm)	Each	15				15	87.00	**1305.00**
22	Supplying 4mm thick plastic sheet with necessary nitches for fixing switches, regulators etc., and fixing on existing wooden or metal box using N.F. screws. **(Page No. 17, Item No. 3.9) KPWD SR 2014-15**								
		sqcm					13333	0.25	**3333.00**

Sl No	Description of item	Unit	No	L	B	D	Qty	Rate	Amount
23	Extra for Groove cutting in brick wall/CC floor to the suitable depth for concealing of Conduit/GI pipe and plastering, finishing upto wall surface complete. upto 50mm conduit in brick wall **(Page No. 03, Item No.1.7.1) KPWD SR 2014-15**								
		Mtr	1	30.00			**30**	21.00	**630.00**
24	Supplying heavy gauge PVC Conduit Pipe 19/20 mm dia 2 mm thick with suitable size bends, metal junction boxes adhesive paste etc., by groove cutting in the wall and fixing by bracing U or J hooks and cement plastering up to the wall surface and run with 18 SWG GI fish wire run throughout the conduit wherever necessary. **(Page No. 02, Item No. 1.3.1) KPWD SR 2014-15**								
			1	25.00			**25**	56.00	**1400.00**
25	Supplying and fixing PBBC/Bakelite straight or slant batten holder and wiring with 60w/230 volts lamps. **(Page No. 20, Item No. 4.2) KPWD SR 2014-15**								
		Each	4				**4**	88.00	**352.00**
26	Supplying patti type fluorescent tube light fitting of 2' - suitable for 14 watts fluorescent tube fitting, made out of M.S. Sheet and stove enameled with HF Electronic Ballast , locking type brass contact holders mounted on double fold type sheet base fully wired for use on 230 volts AC . Supply including T5 lamp. **(Page No. 20, Item No. 4.5) KPWD SR 2014-15**								
		Each	4				**4**	591.00	**2364.00**
27	Wiring for lighting/power circuit using one of FRLS PVC insulated 1100V grade, multistrand Copper with low conductor resistance single core wire in open or concealed system of wiring with specified IS-694:1990 & confirming to GTP of GROUP -A 1.5 sqmm **(Page No. 06, Item No. 2.5.2) KPWD SR 2014-15**								
		Mtr	1	15.00			**15**	18.60	**279.00**
28	Supplying and fixing cast Aluminum round or oblong type bulk head fitting with GI wire guard, glass cover with 60/100 watts 230V GLS lamp. **(Page No. 20, Item No. 4.3) KPWD SR 2014-15**								
		Each	8				**8**	747.00	**5976.00**
29	Supplying, fixing, wiring, earth electrode for grounding conduits, I.C. cutouts and other equipment's on the meter board using 40mm dia 2.90mm thick GI pipe 2.5 mtr long buried in a pit ... The pit should be filled with equal proportion of salt and charcoal 150mm all-round the pipe to complete depth. The connection from the pipe to the conduit etc., is to be established through GI wire of size as per ISI specification 7.3.3. of IS 732 using 12mm dia bolts, nuts, washers and check nuts etc., the pipe shall have 16 through holes of 122 mm dia **(Page No. 55, Item No. 7.1) KPWD SR 2014-15**								
		No	1				**1**	2727.00	**2727.00**
30	Supplying of 1.1 KV LT UG cable having aluminum conductor PVC insulated, extruded inner sheathed, galvanized, steel strip (except 2CX10Sq.mm wire armoured) confirming to IS-3975:1990 (No. of Strip indicated in GTP) & extruded PVC outer sheathed armoured cable with specified IS-1554 Part-1:1988 & confirming to GTP of GROUP-A **P No. 55/ I No. 7.4.4 4 core 16 Sqmm KPWD Electrical SR 2014-15**								
		mtr	1	40.00			**40.00**	140.40	**5616.00**
31	Labour charges for laying of 1.1 KV class UG cable in existing trench GI pipe / stoneware pipe / on wall / on pole as required.In existing trench/duct. **P No. 61 / I No. 7.8.1 6Sqmm to 16 Sqmm) KPWD Electrical SR 2014-15**								
		Mtr	1	40.00			**40.00**	10.80	**432.00**
32	Digging of trench of 0.6m deep x 0.50 mtr wide refilling the trench to the required ground level and consolidating etc., complete For Cutting Road Surface .(As per Civil SR KSRB I-2, P-7) **P No. 61 / I. No. 7.9.3 KPWD Electrical SR 2014-15**								
		Mtr	1	40.00			**40.00**	85.00	**3400.00**
33	Supplying and fixing of class A (medium duty) GI pipe of wall thickness not less than 3.25mm on pole/wall/drain crossing with necessary clamping arrangements for UG cable of 1.1 KV 40mm dia GI pipe **P. No. 62 / I No. 7.12.1 KPWD Electrical SR 2014-15**								
		Mtr	1	4.00			**4.00**	345.00	**1380.00**
34	Supplying and fixing L.T. cast Iron pot heads suitable for 1.1 KV class UG cable filled with necessary bitumen/insulating compound complete with terminals, clamps, bolts, nuts and washers 16Sqmm etc., **P. No. 62 / I.No. 7.13.2 KPWD Electrical SR 2014-15**								
		No.	1				**1.00**	280.00	**280.00**
35	Polyethylene water storage tank of sepcified capacity and make.	L	1				**2000**	6.20	**12400.00**

Sl No	Description of item	Unit	No	L	B	D	Qty	Rate	Amount
36	Providing and fixing Chlorinated Poly Venyl Chloride(CPVC) pipes confirming to IS 15778 having thermal stability for hot and cold water supply including all CPVC plain and brass threaded fittings, this includes refilling and testing of joints complete. (internal work exposed on wall).20mm nominal OD pipes.(Page no.96, Item No. 13.85.2)								
	Basic rate	400							
	Area Weigtage 6%	32							
	Total weight	432							
		m	1				160.00	432.00	69120.00
37	BESCOM Deposit for RO Plant Room		1	10000.00					10000.00
	Total								1276940.00
38	Third Party Inspection charges 1%								12769.40
39	Miscelleneous Charges								290.60
40	Total	L/S							1300000.00
41	For one unit							Total	1300000.00

(Rupees thirteen lakhs only)

Certificate:

1 The work spot has been inspected and the work is found necessary.

2 This estimate is prepared as per C.S.R. of PWD 2016-17, PWD Elecrical 2014-15, PRED 2012-13 & SE-RDED approved Rate.

3 The provisions were made in this estimate are necessary and adequate.

4 This works come under B.B.M.P. limits.

AE (W7)

ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಬ್ಯಾಟರಾಯನಪುರ ವಿಭಾಗ
ಬೃ.ಬೆ.ಮ.ಪಾ., ಬೆಂಗಳೂರು

Administrative Approval
Accorded For 13.00 lakhs
Head of A/C P3110
CER NO: "07" Dt. 24/04/17

TA CE (YNK)

TECHNICAL SANCTION
Accorded For Rs. Thirteen lakhs only
Head of A/c. P-3110
Div. Ref. No. 07/17-18 Date. 24/04/17

AE EE(BTP)